Welcome to sPHENIX Heavy Flavor Jet Topical Group

Mike McCumber (LANL)
Jin Huang (BNL)

News item: Mark your calendar:
Pre-Collaboration Meeting @ BNL May 16 & 17

- A software-focused work-fest style meeting, just prior the 2nd sPHENIX Collaboration Meeting.
- Goals:
  1. Advance the status of the tracking software tools needed
  2. Finalize a response to the ALD charge (due in two weeks)
  3. If sufficient interest presents, expand the scope for additional tracking or simulation needs.
- Agenda page under construction. Please keep tuned!

News item: Future meetings

- For updates, we can use regular sPHENIX meeting
  - Software meeting: Tue 1PM
  - Hardware meeting: tracking/EMCal/HCal meetings
- Email list discussion are always appreciated
- We will setup irregular goal-oriented meetings when sufficient progresses are made or when deadline approaches

Longer term development tasks

- Goals: machinery to produce reliable performance plots on HF jets based on realistic detector simulation:
  - Purity vs Efficiency Plot
  - B-jet RAA Projections
  - Critical topical TG feedback for detector down selections
- Software preparation
  - Vertex resolution in DCA <- Mike coordinates
  - VTX, MAPS -> G4 <- Gaku/VTX, Tony/MAPS
  - GenFit/Kalman filter <- Haiwang/Core, Mike/Interface
  - RAVE/Secondary vertexing <- Sanghoon coordinates
- Algorithm selection and test
  - Track counting <- Dennis/Pythia, Mike coordinates/G4
  - Second vertex mass <- ?/Pythia, Mike?/G4
  - Soft electron tagging <- Jin coordinates /Pythia & G4
- Your inputs and volunteers are appreciated!

Strategy in the response to ALD's charge

- ALD charge sPHENIX project and collaboration for a plan of baseline design scope, cost, and schedule that fit within "$75M" in redirected funds
  - Missing ~$6M to fund sPHENIX baseline scope
  - Due May 31, 2016
- Spokespersons will convene an EC-plus meeting to zero in on a small number of financially acceptable sPHENIX configurations
  - Time scale - Soon (next week)
  - As HF jet TG, we should place a strong requirement to the new acceptable sPHENIX configurations (slide +1)
  - And once these sPHENIX configurations are defined, we need to quantify their impact to HF jets performance (slide +2)
  - One step forward: collect ideas on how we could stage subsystem (slide +3)

Draft requirements to the sPHENIX global discussion, look for your comments and suggestions:

From the HF jet TG, :

- We have to have new inner silicon tracker
- We can't use the ganged outer strips
- We don't require the full eta coverage of the EMCAL
- We don't require an inner HCAL
- We desire an independent magnet cryogenic supply (than that use the RHIC ring)
- We don't require all the HCAL material

ALD's charge: Performance study

- Following narrowed down detector scopes, we plan to follow up following study before May 16
  Volunteer needed for each task!

1. Pythia-based track counting based B-jet eff
   – Mike will coordinate, Volunteer needed
2. Pythia-based soft-lepton tagger performance
   – Jin will coordinate, Volunteer needed
3. Pythia/tracking G4-based secondary vertex performance?
   - Volunteer needed

Stageable ideas for each subsystem:

inner tracker: 1/2 phi coverage, one arm only (heavy flavor on one side, track through vertex one one side)

outer tracker: partial TPC electronics covering only two R segments (pattern reco should still work)

emcal: remove large eta coverage (we don't need all the electrons)

inner hcal: remove entirely, replace with support frame only (we have lower pt jets)

magnet: remove independent cryogenic supply than that from the RHIC rings (align with straight cosmics)

outer hcal: remove steel (we have lower pt jets, stageable?)

Price, optimize cuts, simulate?